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DRINKING WATER SURVEILLANCE PROGRAM

**PORT STANLEY
WATER TREATMENT
PLANT**

REPORT FOR 1991 AND 1992

ISSN 0839-8958

**PORT STANLEY WATER TREATMENT PLANT
DRINKING WATER SURVEILLANCE PROGRAM
REPORT FOR 1991 AND 1992**

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EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM
PORT STANLEY WATER TREATMENT PLANT
1991 AND 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Port Stanley water treatment plant is a conventional treatment plant which treats water from Lake Erie. The process consists of coagulation, flocculation, sedimentation, filtration (using pressure filters), disinfection and fluoridation. This plant has a design capacity of $3.2 \times 1000 \text{ m}^3/\text{day}$. The Port Stanley water treatment plant serves a population of approximately 2,100.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Port Stanley water treatment plant, for the sample years of 1991 and 1992, produced good quality water and this was maintained in the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A " " INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE		RAW		TREATED		LOIS ST	
	TESTS	POSITIVE	TESTS	POSITIVE	TESTS	POSITIVE	TESTS	POSITIVE
BACTERIOLOGICAL	27	17	62	9	1	11	10	0
CHEMISTRY (FIELD)	29	29	100	60	51	85	114	92
CHEMISTRY (LABORATORY)	236	218	92	240	181	75	420	361
METALS	217	97	44	240	71	29	460	192
CHLOROPHENOLS	98	0	0	98	1	1	98	0
CHLOROPHENOLS	6	0	0	6	0	0	-	-
PESTICIDES AND PCB	245	0	0	245	0	0	154	0
PHENOLICS	10	1	10	10	0	0	-	-
POLYAROMATIC HYDROCARBONS	50	0	0	33	0	0	33	0
SPECIFIC PESTICIDES	7	0	0	15	0	0	1	0
VOLATILES	298	0	0	298	41	13	298	40
RADIONUCLIDES	14	2	14	14	3	21	-	-
TOTAL	1,237	364	1,268	349	1,588	685		

DRINKING WATER SURVEILLANCE PROGRAM

PORT STANLEY WATER TREATMENT PLANT 1991 AND 1992 REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Port Stanley water treatment plant in January 1986. Previous annual reports have been published for 1986, 1987, 1988, 1989 and 1990.

PLANT DESCRIPTION

The Port Stanley water treatment plant is a conventional treatment plant which treats water from Lake Erie. The process consists of coagulation, flocculation, sedimentation, filtration (using pressure filters), disinfection and fluoridation. This plant has a design capacity of $3.2 \times 1000 \text{ m}^3/\text{day}$. The Port Stanley water treatment plant serves a population of approximately 2,100.

The sample day flows ranged from $0.98 \times 1000 \text{ m}^3/\text{day}$ to $2.4 \times 1000 \text{ m}^3/\text{day}$.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

SAMPLING AND ANALYSES

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration.

Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative

sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- THE TREATED AND DISTRIBUTED WATER;**
- ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE
GUIDELINE VALUES; AND**
- POSITIVE ORGANIC PARAMETERS DETECTED.**

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water. No results were above the guideline.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of delivered water may increase in the distribution system due to the warming effect of soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in 8 of 20 treated and distributed water samples with a maximum reported value of 21.0°C.

CHEMISTRY (LABORATORY)

Elevated conductivity is often associated with high hardness levels.

Conductivity exceeded the European Economic Community Aesthetic Guideline Level of 400 umho/cm in 1 of 20 treated and distributed water samples with a maximum reported value of 412 umho/cm.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of 80-100 mg/L in all 20 treated and distributed water samples with a maximum reported value of 185.2 mg/L.

Where fluoridation is practiced the recommended concentration is 1.2 mg/L and deviation from this optimum should not exceed + or - 0.2 mg/L. In the summer of 1992 the ODWO Maximum Acceptable Concentration for fluoride was lowered from 2.4 mg/L to 1.5 mg/L. Naturally occurring fluoride should not exceed 2.4 mg/L. The Medical Officer of Health should be notified of any exceedances.

Fluoride exceeded the ODWO recommended operational guideline in 3 of 20 treated and distributed water samples with a maximum reported value of 1.6 mg/L. The maximum observed level was recorded in 1991 before the fluoride guideline was lowered to 1.5 mg/L. The treatment process for adding fluoride should be reviewed.

ORGANIC

CHLOROAROMATICS

2,4,5-Trichlorotoluene was found at a positive level in 1 of the 14 treated and distributed water samples analyzed. The maximum observed level was 59.0 ng/L. There is no drinking water guideline for this parameter.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

PESTICIDES AND PCB

The results of the pesticide and PCB scan showed that none were detected above trace levels.

PHENOLICS

The results of the phenol test showed that none were detected above trace levels.

POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that none were detected.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

Toluene was found at a positive level in 1 of the 20 treated and distributed water samples analyzed. The maximum observed level was 0.95 ug/L. This was below the ODWO Aesthetic Objective of 24 ug/L.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples

from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in all 20 treated and distributed water samples analyzed with a maximum level of 62.6 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

RADIOLOGICAL

RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

CONCLUSIONS

No known health related guidelines were exceeded.

The Port Stanley water treatment plant, for the sample years of 1991 and 1992, produced good quality water and this was maintained in the distribution system.

FIGURE 1

PORT STANLEY WATER TREATMENT PLANT

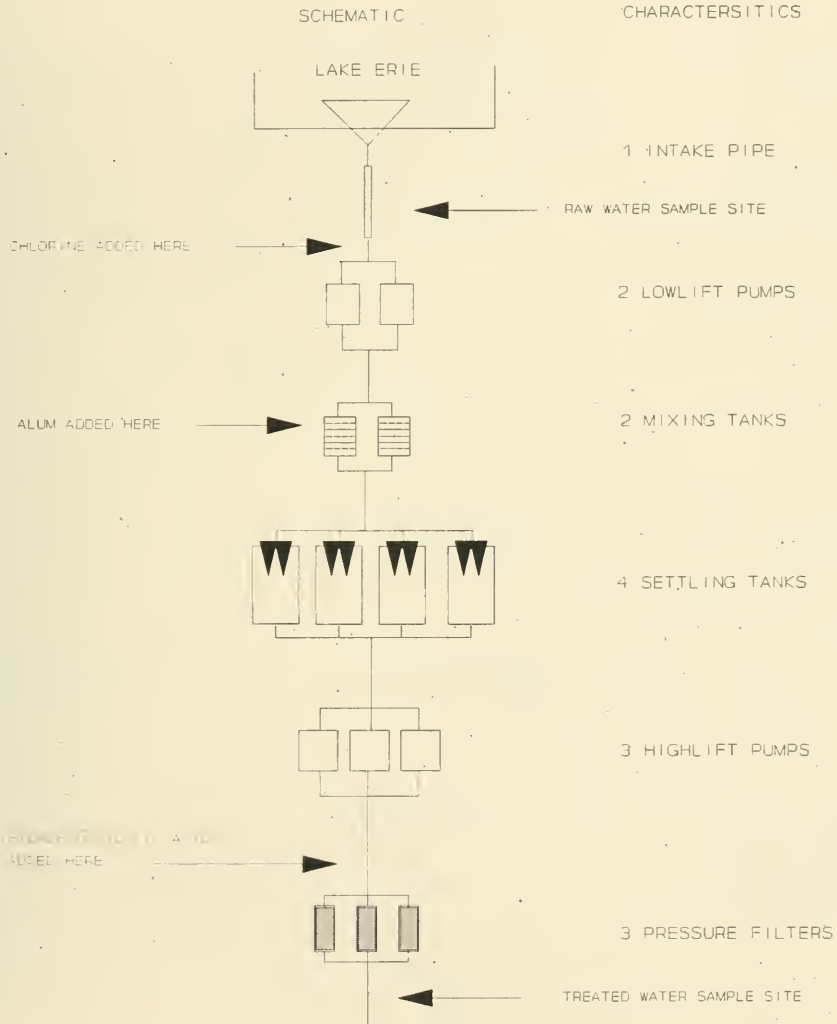


TABLE 1
DRINKING WATER SURVEILLANCE PROGRAM
PLANT GENERAL REPORT

PLANT NAME: PORT STANLEY WTP
WORKS #: 220002459
UTM #: 174818504722470

DISTRICT: LONDON
REGION: SOUTHWEST
DISTRICT OFFICER: C. MURRAY

SUPERINTENDENT: JOHN L. BOLT

ADDRESS: 430 EDITH CAVELL BLVD.
PORT STANLEY, ONTARIO

519-782-3251

MUNICIPALITY: PORT STANLEY
AUTHORITY: MUNICIPAL

PLANT INFORMATION

PLANT VOLUME:	.773	(X 1000 M3)
DESIGN CAPACITY:	3.273	(X 1000 M3/DAY)
RATED CAPACITY:	-	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
-----	-----
PORT STANLEY	2,130
SOUTHWOLD TWP	2
YARMOUTH TWP	58

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING

PARAMETER -----	LOCATION -----	FREQUENCY -----
ALUMINUM	FILTERED	WEEKLY
FREE CHLORINE RESIDUAL	FILTERED	2 TIMES/DAY
FLUORIDE	FILTERED	DAILY READING
PH	FILTERED	DAILY READING
TURBIDITY	FILTERED	DAILY READING
	LAB RAW	DAILY READING
	RAW	DAILY READING

TABLE 3
DRINKING WATER SURVEILLANCE PROGRAM PORT STANLEY WTP SAMPLE DAY CONDITIONS
AND TREATMENT CHEMICAL DOSAGES FOR 1991 AND 1992

DATE	DELAY * TIME(HRS)	FLOW (1000M3)	PRE CHLORINATION CHLORINE	COAGULATION ALUM DRY	FLUORIDATION HYDROFLUOSILICIC ACID
91 FEB 26 18.00	1.094	4.70		8.15	1.35
91 APR 23 16.00	1.084	2.49		8.29	.60
91 JUN 25 7.30	2.430	3.70		2.40	1.87
91 AUG 27 10.00	1.852	10.00		5.00	1.50
91 OCT 29 16.30	1.155	2.75		7.79	1.47
91 NOV 26 17.00	1.109	3.68		8.12	1.63
92 MAR 24 18.30	.987	3.00		9.00	1.50
92 JUN 23 15.30	1.240	2.93		7.26	1.55
92 SEP 29 16.30	1.161	3.50		7.80	.87
92 DEC 15 16.15	1.155	1.99		24.95	1.55

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

KEY TO TABLE 4 and 5

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
 1. Maximum Acceptable Concentration (MAC)
 1+. MAC for Total Trihalomethanes
 2. Interim Maximum Acceptable Concentration (IMAC)
 3. Aesthetic Objective (AO)
 3*. AO for Total Xylenes
 4. Recommended Operational Guideline
 5. Health Related Guidance Value
- B HEALTH & WELFARE CANADA (H&W)
 1. Maximum Acceptable Concentration (MAC)
 2. Proposed MAC
 3. Interim MAC
 4. Aesthetic Objective (AO)
- C WORLD HEALTH ORGANIZATION (WHO)
 1. Guideline Value (GV)
 2. Tentative GV
 3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
 1. Maximum Contaminant Level (MCL)
 2. Suggested No-Adverse Effect Level (SNAEL)
 3. Lifetime Health Advisory
 4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
 1. Health Related Guideline Level
 2. Aesthetic Guideline Level
 3. Maximum Admissable Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

. No Sample Taken

BDL Below Minimum Measurement Amount

<T Greater Than Detection Limit But Not Confident
(SEE INTERPRETATION OF RESULTS ABOVE)

> Results Are Greater Than The Upper Limit

<=> Approximate Result

!48 No Data: Sample Age Exceeded 48 Hours

!AR No Data: No Numeric Results

!AW No Data: Analysis Withdrawn

!BT No Data: Sample Broken In Transit

!CS No Data: Contamination Suspected

!EF No Data: Laboratory Equipment Failure

!IR No Data: Insufficient Sample

!IS No Data: Insufficient Sample

!LA No Data: Laboratory Accident

!NP No Data: No Procedure

!NR No Data: Sample Not Received

!OP No Data: Obscured Plate

!PE No Data: Procedure Error: Sample Discarded

!PR No Data: Preservative Required

!QU No Data: Quality Control Unacceptable

!RE No Data: Received Empty

!RO No Data: No Numeric Results

!SM No Data: Sample Missing

!SS No Data: Sample Improperly Preserved

!U No Data: Sample Unsuitable For Analysis

!UB No Data: Bottle Broken

!UN No Data: Result Unreliable

!UR No Data: Unpreserved Sample Required
A Approximate Value
A3C Approximate, Total Count Exceeded 300 Colonies
A> Approximate Value, Exceeded Normal Range
APS Additional Peak, Less Than, Not Priority Pollutant
ARO Additional Information In Laboratory Report
CRO Calculated Result Only
NAF Not All Required Tests Found
RID Ioncal Calculated on Incomplete Data Set
RMP P and M-Xylene Not Separated
RRR Result Obtained by Repeat Analysis
RRV Rerun Verification
SFA Sample Filtered: Filtrate Analyzed
SIL Sample Incorrectly Labelled
SPS Several Peaks, Small, Not Priority Pollutant
U48 Unreliable: Sample Age Exceeded 48 Hours
UAL Unreliable: Sample Age Exceeded Limit
UAU Unreliable: Sample Age Unknown
UCS Unreliable: Contamination Suspected
WSD Wrong Sample Description On Bottle

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING
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BACTERIOLOGICAL

FECAL COLIFORM MF (CT/100ML)	DET'N LIMIT = 0	GUIDELINE = D (A1)
------------------------------	-----------------	--------------------

1991 APR	76	
1991 JUN	BDL	
1991 AUG	BDL	
1991 OCT	132	
1991 NOV	BDL	
1992 MAR	BDL	
1992 JUN	BDL	
1992 SEP	32	
1992 DEC	4	

STANDARD PLATE CNT MF (CT/ML)	DET'N LIMIT = 0	GUIDELINE = 500 (A3)
-------------------------------	-----------------	----------------------

1991 FEB	1 <=>	
1991 APR	6 <=>	
1991 JUN	1 <=>	
1991 AUG	1 <=>	
1991 OCT	0 <=>	
1991 NOV	31	
1991 DEC	1 <=>	
1992 JAN	0 <=>	
1992 FEB	1 <=>	
1992 MAR	1 <=>	
1992 APR	1 <=>	
1992 MAY	1 <=>	
1992 JUN	1 <=>	
1992 JUL	3 <=>	
1992 AUG	0 <=>	
1992 SEP	1 <=>	
1992 OCT	1 <=>	
1992 NOV	0 <=>	
1992 DEC	1 <=>	

TOTAL COLIFORM MF (CT/100ML)	DET'N LIMIT = 0	GUIDELINE = 5/100ML (A1)
------------------------------	-----------------	--------------------------

1991 APR	6500	
1991 JUN	100 <=>	
1991 AUG	BDL	
1991 OCT	480 A3C	
1991 NOV	67 <=>	
1992 MAR	60 <=>	
1992 JUN	BDL	
1992 SEP	140 A3C	
1992 DEC	210	

T COLIFORM BCKGRD MF (CT/100ML)	DET'N LIMIT = 0	GUIDELINE = N/A
---------------------------------	-----------------	-----------------

1991 APR	21000	
1991 JUN	820	
1991 AUG	40000 >	
1991 OCT	3100 A3C	
1991 NOV	1200	
1992 MAR	360	
1992 JUN	3800 A3C	
1992 SEP	5100 A3C	
1992 DEC	850	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
CHEMISTRY (FIELD)				
FLD CHLORINE (COMB) (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A	
1991 FEB	.200	.200	.200	
1991 APR	.200	.200	.400	
1991 JUN	.200	.200	.300	
1991 AUG	.400	.300	.200	
1991 OCT	.300	.200	.100	
1991 NOV	.200	.100		
1992 MAR	.200	.200	.000	
1992 JUN	.200	.200	.000	
1992 SEP	.200	.200		
1992 DEC	.200	.200	.200	
CHEMISTRY (FIELD)				
FLD CHLORINE FREE (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A	
1991 FEB	.800	.600	.400	
1991 APR	.700	.400	.200	
1991 JUN	.700	.700	.200	
1991 AUG	.500	.200	.100	
1991 OCT	.600	.500	.400	
1991 NOV	.800	.500		
1992 MAR	.900	.500	.400	
1992 JUN	.800	.400	.300	
1992 SEP	.800	.300		
1992 DEC	.500	.600	.600	
CHEMISTRY (TOTAL) (MG/L)				
FLD CHLORINE (TOTAL) (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A	
1991 FEB	1.000	.800	.600	
1991 APR	.900	.600	.600	
1991 JUN	.900	.900	.500	
1991 AUG	.900	.500	.300	
1991 OCT	.900	.700	.500	
1991 NOV	1.000	.600		
1992 MAR	1.100	.300	.400	
1992 JUN	1.000	.600	.300	
1992 SEP	1.000	.500		
1992 DEC	.700	.800	.800	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
CHEMISTRY (FIELD)				
FLO PH (DMNSLESS)		DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5 (A4)	
1991 FEB	7.600	7.100	7.000	
1991 APR	7.700	7.100	7.000	
1991 JUN	7.900	7.400	7.200	
1991 AUG	7.600	7.100	7.200	
1991 OCT	7.800	7.000	6.900	
1991 NOV	7.300	7.000	6.900	
1992 MAR	7.700	7.400	7.200	
1992 JUN	8.000	7.600	7.400	
1992 SEP	8.000	7.400	7.400	
1992 DEC	8.000	7.300	7.300	
FLO TEMPERATURE (DEG.C)				
		DET'N LIMIT = N/A	GUIDELINE = 15 (A3)	
1991 FEB	4.000	.400	.700	
1991 APR	10.000	.900	11.000	
1991 JUN	20.000	18.000	20.000	
1991 AUG	19.000	21.000	23.000	
1991 OCT	14.000	15.000	17.000	
1991 NOV	8.000	10.000	13.000	
1992 MAR	3.000	3.000	9.000	
1992 JUN	15.000	16.000	16.000	
1992 SEP	19.000	19.000	18.000	
1992 DEC	5.000	7.000	10.000	
FLO TURBIDITY (FTU)				
		DET'N LIMIT = N/A	GUIDELINE = 1.0 (A1)	
1991 FEB	10.000	.000	.000	
1991 APR	80.000	.000	.000	
1991 JUN	15.000	.000	.000	
1991 AUG		.000	.000	
1991 OCT	45.000	.000	.000	
1991 NOV	95.000	.000	.000	
1992 MAR	30.000	.010	.000	
1992 JUN	5.000	.000	.000	
1992 SEP	75.000	.000	.000	
1992 DEC	60.000	.000	.000	

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING
CHEMISTRY (LABORATORY)			
ALKALINITY (MG/L)		DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A4)
1991 FEB	100.600	97.700	102.500
1991 APR	110.800	131.700	128.500
1991 JUN	98.500	106.300	118.100
1991 AUG	95.800	91.200	107.700
1991 OCT	99.600	90.900	92.500
1991 NOV	96.500	94.400	94.100
1992 MAR	98.800	91.200	93.700
1992 JUN	94.900	91.300	92.400
1992 SEP	100.500	117.100	117.600
1992 DEC	98.300	113.300	110.900
CALCIUM (MG/L)		DET'N LIMIT = 0.20	GUIDELINE = 100 (F2)
1991 FEB	37.800	40.200	41.900
1991 APR	42.500	53.400	54.000
1991 JUN	34.000	41.600	46.400
1991 AUG	33.400	35.300	42.700
1991 OCT	35.200	36.400	37.500
1991 NOV	33.300	36.900	37.700
1992 MAR	35.400	36.600	38.200
1992 JUN	32.800	34.800	36.300
1992 SEP	35.650	43.400	45.000
1992 DEC	33.800	43.800	43.700
CYANIDE (MG/L)		DET'N LIMIT = 0.001	GUIDELINE = 0.2 (A1)
16 SAMPLES	BDL	BDL	
CHLORIDE (MG/L)		DET'N LIMIT = 0.20	GUIDELINE = 250 (A3)
1991 FEB	15.200	12.700	19.100
1991 APR	16.400	24.700	23.900
1991 JUN	14.800	19.000	21.600
1991 AUG	15.100	17.700	21.000
1991 OCT	16.100	17.000	17.500
1991 NOV	14.700	16.100	16.300
1992 MAR	15.200	16.600	17.500
1992 JUN	14.800	17.300	17.700
1992 SEP	13.600	20.400	21.000
1992 DEC	14.800	19.500	18.900

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
CHEMISTRY (LABORATORY)				
COLOUR (HZU)		DET'N LIMIT = 0.50	GUIDELINE = 5 (A3)	
1991 FEB	2.000 <T	.500 <T	1.000 <T	
1991 APR	29.500	.500 <T	.500 <T	
1991 JUN	BDL	.500 <T	1.000 <T	
1991 AUG	1.500	.500 <T	.500 <T	
1991 OCT	1.500	1.000	1.000 <T	
1991 NOV	5.500	.500 <T	1.000 <T	
1992 MAR	BDL	.500 <T	.500 <T	
1992 JUN	1.000 <T	.500 <T	.500 <T	
1992 SEP	10.500	.500 <T	.500 <T	
1992 DEC	BDL	.500 <T	.500 <T	
CONDUCTIVITY (UMHO/CM)				
		DET'N LIMIT = 1.0	GUIDELINE = 400 (F2)	
1991 FEB	287	324	323	
1991 APR	292	377	398	
1991 JUN	281	342	384	
1991 AUG	269	286	338	
1991 OCT	284	293	299	
1991 NOV	267	297	297	
1992 MAR	281	294	304	
1992 JUN	271	302	295	
1992 SEP	276	293	363	
1992 DEC	266	362	369	
		351		
DISS ORG CARBON (MG/L)				
		DET'N LIMIT = 0.10	GUIDELINE = 5.0 (A3)	
1991 FEB	2.100	1.900	1.900	
1991 APR	2.200	1.800	2.000	
1991 JUN	2.000	1.800	1.700	
1991 AUG	2.000	2.000	1.900	
1991 OCT	2.400	2.000	1.600	
1991 NOV	1.900	1.700	1.900	
1992 MAR	2.000	1.700	2.300	
1992 JUN	2.000	1.700	1.800	
1992 SEP	1.900	1.800	2.100	
1992 DEC	1.900	1.600	1.900	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)	DET'N LIMIT = 0.01		GUIDELINE = 1.5 (A1)	
			LOIS ST FREE FLOW	LOIS ST STANDING	LOIS ST	DIST. SYSTEM
FLUORIDE (MG/L)						
1991 FEB	.120	1.020	1.000		.980	
1991 APR	.120	1.600	1.320		1.420	
1991 JUN	.120	1.520	1.460		1.460	
1991 AUG	.100	1.140	1.120		1.120	
1991 OCT	.100	1.140	1.100		1.080	
1991 NOV	.120	1.200	1.180		1.180	
1992 MAR	.120	1.140	1.140		1.140	
1992 JUN	.080	1.120	1.100		1.100	
1992 SEP	.100	.760	.780		.780	
1992 DEC	.140	.440	.440		.440	
HARDNESS (MG/L)						
1991 FEB	130.400	138.100	144.600		143.500	
1991 APR	163.900	185.200	171.200		183.100	
1991 JUN	122.000	146.000	164.000		164.000	
1991 AUG	119.400	125.500	141.300		150.800	
1991 OCT	123.800	126.800	126.100		130.500	
1991 NOV	120.800	129.000	134.300		131.800	
1991 MAR	125.000	128.000	133.000		133.000	
1992 JUN	118.000	124.000	129.000		129.000	
1992 SEP	126.510	152.730	154.380		156.190	
1992 DEC	121.480	153.940	152.470		152.500	
IONCAL (DNMSLESS)						
1991 FEB	1.095	7.360	2.335		1.870	
1991 APR	2.537 NAF	.750 NAF	2.029 NAF		2.964 NAF	
1991 JUN	2.683	.576	2.727		2.277	
1991 AUG	1.658	.026	1.134		.035	
1991 OCT	.434	2.414	2.211		4.088	
1991 NOV	.306	1.001	5.231		2.624	
1992 MAR	.434 NAF	2.250 NAF	2.470 NAF		2.404 NAF	
1992 JUN	1.704	.598	4.673		2.013	
1992 SEP	3.087	1.482	1.342		.156	
1992 DEC	1.281	3.552	2.270		2.279	
			DET'N LIMIT = N/A		GUIDELINE = N/A	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
CHEMISTRY (LABORATORY)				
POTASSIUM (MG/L)		DET'N LIMIT = 0.01	GUIDELINE = 10 (F2)	
1991 FEB	1.530	1.440	1.490	
1991 APR	1.900	1.900	1.900	
1991 JUN	1.550	1.500	1.600	
1991 AUG	1.400	1.400	1.580	
1991 OCT	1.700	1.370	1.390	
1991 NOV	1.560	1.390	1.420	
1992 MAR	1.710	1.410	1.430	
1992 JUN	1.410	1.400	1.500	
1992 SEP	2.313	1.665	1.400	
1992 DEC	2.741	1.682	1.714	
		1.444	1.458	
LANGELIERS INDEX (COMPLESS)				
		DET'N LIMIT = N/A	GUIDELINE = N/A	
1991 FEB	.356	.302	.249	
1991 APR	.487	.595	.445	
1991 JUN	.373	.370	.329	
1991 AUG	.398	.174	.252	
1991 OCT	.382	.293	.312	
1991 NOV	.351	.344	.309	
1992 MAR	.442 NAF	.317 NAF	.353 NAF	
1992 JUN	.325	.227	.223	
1992 SEP	.375	.489	.506	
1992 DEC	.306	.389	.319	
		DET'N LIMIT = 0.1	GUIDELINE = 30.0 (F2)	
1991 FEB	8.700	9.150	9.450	
1991 APR	9.200	12.600	11.700	
1991 JUN	9.100	10.300	11.600	
1991 AUG	8.800	9.000	10.750	
1991 OCT	8.700	8.700	9.000	
1991 NOV	9.150	9.000	9.150	
1992 MAR	8.940	8.960	9.110	
1992 JUN	8.730	9.050	9.270	
1992 SEP	9.110	10.790	10.640	
1992 DEC	9.010	10.830	10.500	
MAGNESIUM (MG/L)		DET'N LIMIT = 0.1	GUIDELINE = 30.0 (F2)	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT TREATED DIST. SYSTEM
RAW LOIS ST
FREE FLOW STANDING

CHEMISTRY (LABORATORY)				GUIDELINE = 200 (A4)	
SODIUM (MG/L)		DET'N LIMIT = 0.20			
1991 FEB	7.800	8.500	9.300	9.300	
1991 APR	8.500	13.600	12.000	13.100	
1991 JUN	7.600	9.800	11.000	11.000	
1991 AUG	8.100	8.700	9.500	10.500	
1991 OCT	9.100	8.700	8.900	9.100	
1991 NOV	7.300	7.600	7.900	8.200	
1992 MAR	8.610	8.670	8.930	9.160	
1992 JUN	8.180	8.700	8.900	8.970	
1992 SEP	8.510	11.360	11.510	11.570	
1992 DEC	7.850	10.260	9.900	9.880	
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = 0.05 (F2)	
1991 FEB	.016	BDL	BDL	BDL	
1991 APR	.014	.006 <T	.008 <T	.008 <T	
1991 JUN	.016	.002 <T	BDL	BDL	
1991 AUG	.014	.002 <T	.006 <T	.006 <T	
1991 OCT	BDL	BDL	.004 <T	.002 <T	
1991 NOV	.012	BDL	.002 <T	.006 <T	
1992 MAR	.014	BDL	BDL	.014	
1992 JUN	.020	BDL	BDL	BDL	
1992 SEP	BDL	BDL	BDL	.002 <T	
1992 DEC	.006 <T	BDL	BDL	BDL	
NITRITE (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 1.0 (A1)	
1991 FEB	.008	BDL	BDL	BDL	
1991 APR	.016	BDL	BDL	.001 <T	
1991 JUN	.007	BDL	.001 <T	.001 <T	
1991 AUG	.007	BDL	.001 <T	.001 <T	
1991 OCT	.013	.001 <T	.001 <T	.001 <T	
1991 NOV	.019	BDL	BDL	.001 <T	
1992 MAR	.011	BDL	BDL	.002 <T	
1992 JUN	.005	BDL	BDL	.001 <T	
1992 SEP	.022	BDL	BDL	BDL	
1992 DEC	.019	BDL	BDL	BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING
CHEMISTRY (LABORATORY)			
NITRATE (TOTAL) (MG/L)			
1991 FEB	.615	.650	.655
1991 APR	.595	.520	.615
1991 JUN	.205	.275	.275
1991 AUG	.170	.205	.220
1991 OCT	.290	.240	.245
1991 NOV	.210	.250	.280
1991 MAR	.325	.260	.380
1992 JUN	.110	.125	.135
1992 SEP	.440	.445	.445
1992 DEC	.345	.370	.365
GUIDELINE = 10.0 (A1)			
NITROGEN TOT KJELD (MG/L)			
1991 FEB	.240	.160	.170
1991 APR	.310	.150	.160
1991 JUN	.220	.150	.190
1991 AUG	.190	.130	.190
1991 OCT	.410	.190	.250
1991 NOV	.360	.170	.200
1992 MAR	.220	.200	.180
1992 JUN	.210	.120	.240
1992 SEP	.300	.150	.180
1992 DEC	.100	.170	.200
GUIDELINE = N/A			
PH (DIMSLESS)			
1991 FEB	8.210	8.030	8.060
1991 APR	8.250	8.200	8.200
1991 JUN	8.280	8.170	8.110
1991 AUG	8.320	8.100	8.010
1991 OCT	8.270	8.210	8.090
1991 NOV	8.270	8.240	8.090
1992 MAR	8.330	8.230	8.190
1992 JUN	8.260	8.160	8.240
1992 SEP	8.250	8.230	8.160
1992 DEC	8.210	8.140	8.230
GUIDELINE = 6.5-8.5 (A4)			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING
CHEMISTRY (LABORATORY)			
PHOSPHORUS FIL REACT (MG/L)	DET*N LIMIT = 0.0005		
	GUIDELINE = N/A		
1991 FEB	.015	.001 <T	*
1991 APR	.024	.002 <T	*
1991 JUN	.011	.000 <T	*
1991 AUG	.002 <T	.000 <T	*
1991 OCT	.021	.001 <T	*
1991 NOV	.043	.002 <T	*
1992 MAR	.018	80L	*
1992 JUN	.003 <T	.001 <T	*
1992 SEP	.029	.002 <T	*
1992 DEC	.025	.001 <T	*
PHOSPHORUS TOTAL (MG/L)	DET*N LIMIT = 0.002		
	GUIDELINE = 0.40 (F2)		
1991 FEB	.020	.004 <T	*
1991 APR	.067	.002 <T	*
1991 JUN	.018	.002 <T	*
1991 AUG	.008 <T	.003 <T	*
1991 OCT	.072	.003 <T	*
1991 NOV	.125	.003 <T	*
1992 MAR	.030	.010	*
1992 JUN	.006 <T	.003 <T	*
1992 SEP	.095	.014	*
1992 DEC	.025	.003 <T	*
RESIDUE FILTRATE (MG/L)	DET*N LIMIT = N/A		
	GUIDELINE = 500 (A3)		
1991 FEB	193.000 CRO	200.000 CRO	210.000 CRO
1991 APR	190.000 CRO	268.000 CRO	259.000 CRO
1991 JUN	183.000 CRO	222.000 CRO	250.000 CRO
1991 AUG	175.000 CRO	186.000 CRO	220.000 CRO
1991 OCT	185.000 CRO	190.000 CRO	194.000 CRO
1991 NOV	174.000 CRO	193.000 CRO	193.000 CRO
1992 MAR	183.000 CRO	191.000 CRO	198.000 CRO
1992 JUN	176.000 CRO	189.000 CRO	192.000 CRO
1992 SEP	179.000 CRO	233.000 CRO	236.000 CRO
1992 DEC	173.000	231.000	227.000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)	DIST. SYSTEM		DIST. SYSTEM LOIS ST STANDING
			LOIS ST FREE FLOW	LOIS ST STANDING	
SULPHATE (MG/L)			DET'N LIMIT = 0.20		GUIDELINE
1991 FEB	22.330	28.500	29.930	29.560	
1991 APR	23.760	44.950	39.500	41.590	
1991 JUN	23.540	35.050	42.480	42.540	
1991 AUG	22.650	27.910	31.400	36.040	
1991 OCT	21.970	27.010	26.840	27.260	
1991 NOV	20.250	26.890	27.370	28.280	
1992 MAR	24.290	28.840	30.090	29.870	
1992 JUN	22.660	28.100	28.440	28.110	
1992 SEP	21.340	33.330	33.400	33.540	
1992 DEC	22.500	40.560	38.580	39.160	
TURBIDITY (FTU)			DET'N LIMIT = 0.05		GUIDELINE
1991 FEB	14,800 RRV	.400	.490	.660	
1991 APR	94,000	.260	.410	.740	
1991 JUN	15,200	.310	.230	.200	
1991 AUG	2,300	.270	.300	.340	
1991 OCT	31,000	.270	.260	.640	
1991 NOV	122,000	.690	.610	.740	
1992 MAR	34,000	.230 <†	.470	.830	
1992 JUN	3,100	.300	.200 <†	.310	
1992 SEP	117,000	.760	.600	.970	
1992 DEC	95,100	.310	.330	.420	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW		DIST. SYSTEM LOIS ST STANDING	
METALS						
GUIDELINE						
SILVER (UG/L)			DET'N LIMIT = 0.05			
39 SAMPLES	BOL	BOL	BOL	BOL	BOL	BOL
GUIDELINE						
ALUMINUM (UG/L)			DET'N LIMIT = 0.10			
1991 FEB	120.000	56.000	59.000	62.000		
1991 APR	ISM	44.000	45.000	51.000		
1991 JUN	200.000	75.000	64.000	66.000		
1991 AUG	55.000	100.000	88.000	75.000		
1991 OCT	310.000	78.000	72.000	72.000		
1991 NOV	972.000	71.000	64.000	62.000		
1992 MAR	51.000	54.000	50.000	51.000		
1992 JUN	65.000	64.000	61.000	63.000		
1992 SEP	490.000	100.000	100.000	100.000		
1992 DEC	570.000	40.000	44.000	44.000		
GUIDELINE						
ARSENIC (UG/L)			DET'N LIMIT = 0.10			
1991 FEB	.630 <T	.510 <T	.640 <T	.510 <T		
1991 APR	ISM	.480 <T	.540 <T	.510 <T		
1991 JUN	.680 <T	.610 <T	.680 <T	.810 <T		
1991 AUG	.850 <T	.660 <T	.590 <T	.680 <T		
1991 OCT	1.000 <T	.620 <T	.510 <T	.730 <T		
1991 NOV	1.200	.430 <T	.400 <T	.490 <T		
1992 MAR	.860 <T	.690 <T	.620 <T	.720 <T		
1992 JUN	.660 <T	.810 <T	.480 <T	.650 <T		
1992 SEP	.670 <T	.120 <T	.160 <T	BOL		
1992 DEC	.870 <T	.350 <T	.340 <T	.370 <T		
GUIDELINE						
BARIUM (UG/L)			DET'N LIMIT = 0.05			
1991 FEB	22.000	21.000	22.000	22.000		
1991 APR	ISM	31.000	28.000	30.000		
1991 JUN	26.000	24.000	28.000	30.000		
1991 AUG	22.000	21.000	24.000	25.000		
1991 OCT	25.000	20.000	20.000	21.000		
1991 NOV	29.000	20.000	20.000	21.000		
1992 MAR	25.000	24.000	24.000	24.000		
1992 JUN	22.000	22.000	23.000	22.000		
1992 SEP	36.000	29.000	30.000	29.000		
1992 DEC	28.000	25.000	23.000	23.000		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
BORON (UG/L)				
		DET'N LIMIT = 2.00		GUIDELINE = 5000 (A1)
1991 FEB	25.000	20.000 <T	24.000	22.000
1991 APR	ISM	25.000	23.000	24.000
1991 JUN	20.000 <T	22.000	25.000	30.000
1991 AUG	31.000	30.000	27.000	36.000
1991 OCT	30.000	24.000	23.000	24.000
1991 NOV	20.000 <T	23.000	21.000	21.000
1991 MAR	34.000	29.000	33.000	23.000
1992 JUN	21.000	19.000 <T	20.000 <T	20.000 <T
1992 SEP	23.000	26.000	26.000	28.000
1992 DEC	20.000 <T	23.000	24.000	23.000
BERYLLIUM (UG/L)				
		DET'N LIMIT = 0.05		GUIDELINE = 6800 (D4)
1991 FEB	BOL	BOL	BOL	BOL
1991 APR	ISM	BOL	BOL	BOL
1991 JUN	BOL	BOL	BOL	BOL
1991 AUG	BOL	BOL	BOL	.060 <T
1991 OCT	BOL	BOL	BOL	BOL
1991 NOV	.080 <T	BOL	BOL	BOL
1992 MAR	BOL	BOL	BOL	BOL
1992 JUN	BOL	BOL	BOL	.060 <T
1992 SEP	BOL	BOL	BOL	.110 <T
1992 DEC	.080 <T	BOL	BOL	BOL
CADMIUM (UG/L)				
		DET'N LIMIT = 0.05		GUIDELINE = 5.0 (A1)
1991 FEB	BOL	BOL	BOL	BOL
1991 APR	ISM	BOL	BOL	BOL
1991 JUN	BOL	BOL	BOL	.080 <T
1991 AUG	BOL	BOL	BOL	BOL
1991 OCT	BOL	BOL	.060 <T	BOL
1991 NOV	.090 <T	BOL	BOL	.060 <T
1992 MAR	BOL	BOL	BOL	BOL
1992 JUN	BOL	BOL	BOL	BOL
1992 SEP	BOL	BOL	BOL	BOL
1992 DEC	BOL	BOL	BOL	BOL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING
METALS			
COBALT (UG/L)		DET'N LIMIT = 0.02	
1991 FEB	.330 <T	.250 <T	.290 <T
1991 APR	ISM	.130 <T	.190 <T
1991 JUN	.410 <T	.220 <T	.360 <T
1991 AUG	.120 <T	.120 <T	.110 <T
1991 OCT	.440 <T	.150 <T	.110 <T
1991 NOV	1.100	.090 <T	.030 <T
1992 MAR	.050 <T	.100 <T	.110 <T
1992 JUN	.250 <T	.210 <T	.330 <T
1992 SEP	.830 <T	.230 <T	.370 <T
1992 DEC	.720 <T	.070 <T	.070 <T
CHROMIUM (UG/L)		DET'N LIMIT = 0.50	
1991 FEB	3.000 <T	1.200 <T	2.500 <T
1991 APR	ISM	1.400 <T	1.500 <T
1991 JUN	.800 <T	BOL	.740 <T
1991 AUG	1.500 <T	1.500 <T	.700 <T
1991 OCT	3.300 <T	1.200 <T	1.100 <T
1991 NOV	1.800 <T	1.300 <T	.560 <T
1992 MAR	3.000 <T	1.700 <T	1.800 <T
1992 JUN	.520 <T	BOL	BOL
1992 SEP	2.800 <T	BOL	BOL
1992 DEC	1.200 <T	BOL	.510 <T
COPPER (UG/L)		DET'N LIMIT = 0.50	
1991 FEB	15.000	1.500 <T	7.300
1991 APR	ISM	1.500 <T	6.700
1991 JUN	5.400	1.600 <T	12.000
1991 AUG	8.000	1.700 <T	11.000
1991 OCT	17.000	1.700 <T	9.700
1991 NOV	18.000	1.200 <T	6.100
1992 MAR	4.300 <T	1.700 <T	6.300
1992 JUN	14.000	1.700 <T	8.300
1992 SEP	30.000	1.300 <T	7.300
1992 DEC	11.000	1.300 <T	5.000 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
METALS				
IRON (UG/L)		DET'N LIMIT = 6.00	GUIDELINE = 300 (A3)	
1991 FEB	220.000	9.300 <T	16.000 <T	26.000 <T
1991 APR	1SM	18.000 <T	24.000 <T	31.000 <T
1991 JUN	320.000	12.000 <T	10.000 <T	12.000 <T
1991 AUG	57.000 <T	59.000 <T	BOL	9.700 <T
1991 OCT	580.000	11.000 <T	24.000 <T	21.000 <T
1991 NOV	2000.000	34.000 <T	36.000 <T	41.000 <T
1992 MAR	22.000 <T	10.000 <T	21.000 <T	24.000 <T
1992 JUN	66.000	8.700 <T	BOL	10.000 <T
1992 SEP	970.000	13.000 <T	14.000 <T	19.000 <T
1992 DEC	1000.000	8.500 <T	8.400 <T	11.000 <T
MERCURY (UG/L)		DET'N LIMIT = 0.02	GUIDELINE = 1.0 (A1)	
20 SAMPLES	BOL	BOL		
MANGANESE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 50.0 (A3)	
1991 FEB	8.900	.580	.800	1.100
1991 APR	1SM	1.300	1.300	2.000
1991 JUN	10.000	.360 <T	.600	.710
1991 AUG	5.000	.770	.350 <T	.920
1991 OCT	43.000	.370 <T	1.200	1.500
1991 NOV	170.000	.500 <T	.710	.730
1992 MAR	.510	.360 <T	.700	.920
1992 JUN	3.000	.300 <T	.340 <T	.500 <T
1992 SEP	51.000	.350 <T	.440 <T	.800
1992 DEC	37.000	.290 <T	.430 <T	.560
MOLYBDENUM (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = N/A	
1991 FEB	.730	1.100	1.100	1.100
1991 APR	1SM	1.400	1.300	1.400
1991 JUN	.930	1.400	1.400	1.400
1991 AUG	1.300	1.400	1.300	1.500
1991 OCT	.660	1.400	1.300	1.300
1991 NOV	.430 <T	1.300	1.300	1.300
1992 MAR	1.600	1.300	1.400	1.300
1992 JUN	1.100	1.100	1.200	1.200
1992 SEP	.460 <T	1.500	1.400	1.500
1992 DEC	.420 <T	1.300	1.200	1.200

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	TREATMENT PLANT	DIST. SYSTEM FREE FLOW		DIST. SYSTEM LOIS ST STANDING	
METALS							
NICKEL (UG/L)		DET'N LIMIT = 0.20			GUIDELINE		
1991 FEB	2.400	2.000 <T	2.500	3.200			
1991 APR	ISM	BDL	BDL	BDL			
1991 JUN	1.000 <T	.690 <T	.570 <T	1.000 <T			
1991 AUG	1.600 <T	1.400 <T	1.400 <T	2.700			
1991 OCT	2.000 <T	.820 <T	1.300 <T	2.600			
1991 NOV	1.800 <T	BDL	BDL	.610 <T			
1992 MAR	1.300 <T	1.900 <T	2.000 <T	2.800			
1992 JUN	1.600 <T	1.500 <T	1.800 <T	2.400			
1992 SEP	BDL	1.400 <T	BDL	3.300			
1992 DEC	2.800	1.900 <T	2.000 <T	2.100			
LEAD (UG/L)		DET'N LIMIT = 0.05			GUIDELINE		
1991 FEB	.850	.060 <T	.170 <T	.860			
1991 APR	ISM	.060 <T	.250 <T	.960			
1991 JUN	.340 <T	.130 <T	.440 <T	1.400			
1991 AUG	.630	.270 <T	.480 <T	1.400			
1991 OCT	1.300	BDL	1.200	1.100			
1991 NOV	2.200	BDL	.220 <T	.780			
1992 MAR	BDL	.180 <T	.240 <T	.990			
1992 JUN	330 <T	.320 <T	.350 <T	.780			
1992 SEP	1.800	.240 <T	.430 <T	1.400			
1992 DEC	1.000	.070 <T	.220 <T	.560			
ANTIMONY (UG/L)		DET'N LIMIT = 0.05			GUIDELINE		
1991 FEB	.440 <T	.420 <T	.540	.570			
1991 APR	ISM	.590	.700	.610			
1991 JUN	.580	.570	.990	.890			
1991 AUG	.720	.630	.740	.810			
1991 OCT	.380 <T	.510	.500 <T	.630			
1991 NOV	.390 <T	.620	.540	.920			
1992 MAR	.590	.480 <T	.460 <T	.920			
1992 JUN	.470 <T	.670	.510	.600			
1992 SEP	.470 <T	.570	.580	.610			
1992 DEC	.270 <T	.450 <T	.400 <T	.480 <T			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW STANDING		DIST. SYSTEM LOIS ST STANDING	
METALS						
SELENIUM (UG/L)		METALS		GUIDELINE = 10 (A1)		
DET'N LIMIT = 1.00		DET'N LIMIT = 1.00		GUIDELINE = 10 (A1)		
1991 FEB	BDL	BDL	1.300 <T	1.200 <T		
1991 APR	ISM	BDL	1.300 <T	BDL		
1991 JUN	1.500 <T	1.100 <T	1.600 <T	1.800 <T		
1991 AUG	1.100 <T	1.100 <T	1.800 <T	BDL		
1991 OCT	BDL	1.200 <T	1.400 <T	1.200 <T		
1991 NOV	BDL	1.200 <T	1.400 <T	1.400 <T		
1992 MAR	BDL	1.600 <T	BDL	BDL		
1992 JUN	BDL	BDL	BDL	BDL		
1992 SEP	BDL	BDL	BDL	BDL		
1992 DEC	BDL	BDL	BDL	BDL		
STRONTIUM (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = N/A		
1991 FEB	150.000	150.000	160.000	160.000		
1991 APR	ISM	240.000	220.000	220.000		
1991 JUN	160.000	200.000	230.000	260.000		
1991 AUG	150.000	160.000	190.000	200.000		
1991 OCT	160.000	150.000	150.000	150.000		
1991 NOV	160.000	160.000	160.000	160.000		
1992 MAR	160.000	170.000	170.000	170.000		
1992 JUN	150.000	150.000	160.000	160.000		
1992 SEP	200.000	210.000	210.000	210.000		
1992 DEC	170.000	210.000	200.000	200.000		
TITANIUM (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = N/A		
1991 FEB	5.300	3.000 <T	3.100 <T	3.000 <T		
1991 APR	ISM	6.400	6.000	6.600		
1991 JUN	6.700	3.000 <T	3.500 <T	3.800 <T		
1991 AUG	3.600 <T	1.300 <T	1.500 <T	1.400 <T		
1991 OCT	8.100	1.900 <T	2.200 <T	1.800 <T		
1991 NOV	13.000	2.900 <T	2.700 <T	2.700 <T		
1992 MAR	5.500	4.200 <T	4.900 <T	5.000 <T		
1992 JUN	5.200	3.500 <T	3.400 <T	4.100 <T		
1992 SEP	11.000	2.600 <T	2.400 <T	2.800 <T		
1992 DEC	11.000	1.700 <T	1.700 <T	1.700 <T		
THALLIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 13 (04)		
39 SAMPLES	BDL	BDL	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING
METALS			
URANIUM (UG/L)		DET'N LIMIT = 0.05	
GUIDELINE		GUIDELINE	
1991 FEB	.450 <T	.370 <T	.390 <T
1991 APR	ISM	.570	.460 <T
1991 JUN	.390 <T	.460 <T	.510
1991 AUG	.390 <T	.330 <T	.380 <T
1991 OCT	.410 <T	.290 <T	.260 <T
1991 NOV	.370 <T	.290 <T	.340 <T
1992 MAR	.470 <T	.380 <T	.360 <T
1992 JUN	.400 <T	.280 <T	.300 <T
1992 SEP	.440 <T	.540	.540
1992 DEC	1.100	.600	.420 <T
VANADIUM (UG/L)		DET'N LIMIT = 0.05	
GUIDELINE		GUIDELINE	
1991 FEB	.360 <T	.100 <T	.110 <T
1991 APR	ISM	.130 <T	.160 <T
1991 JUN	.410 <T	BDL	BDL
1991 AUG	.280 <T	.170 <T	.190 <T
1991 OCT	1.000	.310 <T	.300 <T
1991 NOV	1.900	.070 <T	BDL
1992 MAR	.110 <T	.080 <T	BDL
1992 JUN	.170 <T	.070 <T	.130 <T
1992 SEP	1.200	.260 <T	.210 <T
1992 DEC	1.700	.260 <T	.250 <T
ZINC (UG/L)		DET'N LIMIT = 0.20	
GUIDELINE		GUIDELINE	
1991 FEB	23.000	4.300	3.700
1991 APR	ISM	4.100	5.000
1991 JUN	16.000	7.300	4.700
1991 AUG	10.000	2.300	3.700
1991 OCT	10.000	2.200	5.100
1991 NOV	15.000	2.400	2.400
1992 MAR	.360 <T	1.900 <T	2.200
1992 JUN	4.000	3.600	3.600
1992 SEP	22.000	3.100	4.400
1992 DEC	11.000	3.300	3.500

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
CHLOROAROMATICS				
HEXACHLOROBUTADIENE (NG/L)				
21 SAMPLES	BDL	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = 450 (04)
123-TRICHLOROBENZENE (NG/L)				
21 SAMPLES	BDL	BDL	BDL	DET'N LIMIT = 5,000 GUIDELINE = N/A
1234-TETCHLOROBENZENE (NG/L)				
21 SAMPLES	BDL	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = N/A
1235-TETCHLOROBENZENE (NG/L)				
21 SAMPLES	BDL	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = N/A
124-TRICHLOROBENZENE (NG/L)				
1991 FEB	BDL	BDL	BDL	DET'N LIMIT = 5,000 GUIDELINE = 10000 (1)
1991 APR	BDL	BDL	BDL	
1991 JUN	1AW	1AW	1AW	
1991 AUG	1AW	1AW	1AW	
1991 OCT	1QU	1QU	1QU	
1991 NOV	10,000 <1	BDL	BDL	
1992 MAR	BDL	BDL	BDL	
1992 JUN	BDL	BDL	BDL	
1992 SEP	BDL	BDL	BDL	
1992 DEC	BDL	BDL	BDL	
1245-TETCHLOROBENZENE (NG/L)				
21 SAMPLES	BDL	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = 38000 (04)
135-TRICHLOROBENZENE (NG/L)				
21 SAMPLES	BDL	BDL	BDL	DET'N LIMIT = 5,000 GUIDELINE = N/A
HEXACHLOROBENZENE (NG/L)				
21 SAMPLES	BDL	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = 10 (C1)

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
CHLOROAROMATICS				
HEXACHLOROETHANE (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 1900 (04)	
1991 FEB	BDL	BDL	6.000 <T	
1991 APR	BDL	4.000 <T	BDL	
1991 JUN	!AW	!AW	!AW	
1991 AUG	!AW	!AW	!AW	
1991 OCT	!QU	!QU	!QU	
1991 NOV	BDL	2.000 <T	2.000 <T	
1992 MAR	BDL	BDL	4.000 <T	
1992 JUN	BDL	BDL	BDL	
1992 SEP	BDL	1.000 <T	BDL	
1992 DEC	BDL	BDL	BDL	
OCTACHLOROSTYRENE (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = N/A	
21 SAMPLES	BDL	BDL	BDL	
PENTACHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 74000 (04)	
21 SAMPLES	BDL	BDL	BDL	
236-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = N/A	
21 SAMPLES	BDL	BDL	BDL	
245-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = N/A	
1991 FEB	BDL	BDL	BDL	
1991 APR	BDL	59.000	41.000 <T	
1991 JUN	!AW	!AW	!AW	
1991 AUG	!AW	!AW	!AW	
1991 OCT	!QU	!QU	!QU	
1991 NOV	BDL	BDL	BDL	
1992 MAR	BDL	BDL	BDL	
1992 JUN	BDL	BDL	BDL	
1992 SEP	BDL	BDL	BDL	
1992 DEC	BDL	BDL	BDL	
26A-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = N/A	
21 SAMPLES	BDL	BDL	BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
CHLOROPHENOLS				
234-TRICHLOROPHENOL (NG/L)		DET'N LIMIT = 100.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
234,5-TETCHLOROPHENOL (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
2356-TETCHLOROPHENOL (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
245-TRICHLOROPHENOL (NG/L)		DET'N LIMIT = 100.0	GUIDELINE = 2600000 (D4)	
2 SAMPLES	BDL			
246-TRICHLOROPHENOL (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = 5000 (A1)	
2 SAMPLES	BDL			
PENTACHLOROPHENOL (NG/L)		DET'N LIMIT = 10.00	GUIDELINE = 60000 (A1)	
2 SAMPLES	BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
PESTICIDES AND PCB				
ALDRIN (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 700 (A1)	
21 SAMPLES	BDL	BDL		
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 700 (G)	
1991 FEB	1.000 <T	BDL	1.000 <T	
1991 APR	BDL	BDL	BDL	
1991 JUN	1AW	1AW	1AW	
1991 AUG	1AW	1AW	1AW	
1991 OCT	1QU	1QU	1QU	
1991 NOV	1.000 <T	BDL	1.000 <T	
1992 MAR	BDL	BDL	BDL	
1992 JUN	BDL	BDL	1.000 <T	
1992 SEP	BDL	BDL	BDL	
1992 DEC	BDL	BDL	BDL	
BETA BHC (NG/L)		DET'N LIMIT = 1.00	GUIDELINE = 300 (G)	
21 SAMPLES	BDL	BDL		
LINDANE (GAMMA BHC) (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 4000 (A1)	
21 SAMPLES	BDL	BDL		
ALPHA CHLORDANE (NG/L)		DET'N LIMIT = 2.000	GUIDELINE = 7000 (A1)	
21 SAMPLES	BDL	BDL		
GAMMA CHLORDANE (NG/L)		DET'N LIMIT = 2.00	GUIDELINE = 7000 (A1)	
21 SAMPLES	BDL	BDL		
DIELDRIN (NG/L)		DET'N LIMIT = 2.00	GUIDELINE = 700 (A1)	
21 SAMPLES	BDL	BDL		
METHOXYCHLOR (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = 900000 (A1)	
21 SAMPLES	BDL	BDL		
ENDOSULFAN 1 (NG/L)		DET'N LIMIT = 2.00	GUIDELINE = 74000 (D4)	
21 SAMPLES	BDL	BDL		
ENDOSULFAN II (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = 74000 (D4)	
21 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
PESTICIDES AND PCB				
ENDRIN (NG/L)	)	DET'N LIMIT = 5.000	GUIDELINE = 1600 (03)	
21 SAMPLES	BOL	BOL		
ENDOSULFAN SULPHATE (NG/L)	)	DET'N LIMIT = 5.00	GUIDELINE = N/A	
21 SAMPLES	BOL	BOL		
HEPTACHLOR EPOXIDE (NG/L)	)	DET'N LIMIT = 1.000	GUIDELINE = 3000 (A1)	
15 SAMPLES	BOL	BOL		
HEPTACHLOR (NG/L)	)	DET'N LIMIT = 1.000	GUIDELINE = 3000 (A1)	
21 SAMPLES	BOL	BOL		
MIREX (NG/L)	)	DET'N LIMIT = 5.000	GUIDELINE = N/A	
21 SAMPLES	BOL	BOL		
OXYCHLORDANE (NG/L)	)	DET'N LIMIT = 2.000	GUIDELINE = N/A	
21 SAMPLES	BOL	BOL		
O,P-DDT (NG/L)	)	DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)	
21 SAMPLES	BOL	BOL		
PCB (NG/L)	)	DET'N LIMIT = 20.00	GUIDELINE = 3000 (A2)	
21 SAMPLES	BOL	BOL		
P,P-DDD (NG/L)	)	DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)	
21 SAMPLES	BOL	BOL		
P,P-DDD (NG/L)	)	DET'N LIMIT = 1.000	GUIDELINE = 30000 (A1)	
21 SAMPLES	BOL	BOL		
P,P-DDT (NG/L)	)	DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)	
21 SAMPLES	BOL	BOL		
TOXAPHENE (NG/L)	)	DET'N LIMIT = 500.0	GUIDELINE = 5000 (A1)	
18 SAMPLES	BOL	BOL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	PESTICIDES AND PCB	
				AMETRINE (NG/L)	GUIDELINE = 300000 (D3)
14 SAMPLES	BDL			BDL	

ATRAZINE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 60000 (A2)	
1991 FEB	240.000 <T				
1991 APR	70.000 <T				
1991 JUN	IAW				
1991 AUG	IAW				
1991 OCT	IAW				
1991 NOV	60.000 <T				
1992 MAR	160.000 <T				
1992 JUN	180.000 <T				
1992 SEP	140.000 <T				
1992 DEC	180.000 <T				

ATRAZONE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A	
14 SAMPLES	BDL				

CYANAZINE (BLADEX) (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 10000 (A2)	
14 SAMPLES	BDL				

DESETHYL ATRAZINE (NG/L)		DET'N LIMIT = 200.0		GUIDELINE = 60000 (A2)	
14 SAMPLES	BDL				

DESETHYL SIMAZINE (NG/L)		DET'N LIMIT = 200.0		GUIDELINE = 10000 (A2)	
14 SAMPLES	BDL				

PROMETONE (NG/L)		DET'N LIMIT = 50.000		GUIDELINE = 52500 (D3)	
14 SAMPLES	BDL				

PROPACINE (NG/L)		DET'N LIMIT = 50.000		GUIDELINE = 700000 (D3)	
14 SAMPLES	BDL				

PROMETRYNE (NG/L)		DET'N LIMIT = 50.000		GUIDELINE = 1000 (A2)	
14 SAMPLES	BDL				

METRIBUZIN (SENCOR) (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 80000 (A1)	
14 SAMPLES	BDL				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
PESTICIDES AND PCB				
SIMAZINE (NG/L)		DET'N LIMIT = 50.00	GUIDELINE = 10000 (A2)	
14 SAMPLES	BDL			
ALACHLOR (LASSO) (NG/L)		DET'N LIMIT = 500.0	GUIDELINE = 5000 (A2)	
14 SAMPLES	BDL			
METOLACHLOR (NG/L)		DET'N LIMIT = 500.0	GUIDELINE = 50000 (A2)	
14 SAMPLES	BDL			
HEXACHLOROCYCLOPENTADIEN (NG/L)		DET'N LIMIT = 5.00	GUIDELINE = 206000 (D4)	
1991 FEB	BDL	13.000 <T		
1991 APR	BDL	11.000 <T		
1991 JUN	1AW	1AW		
1991 AUG	1AW	1AW		
1991 OCT	1QU	1QU		
1991 NOV	BDL	26.000 <T		
1992 MAR	1QU	1QU		
1992 JUN	1QU	1QU		
1992 SEP	1QU	1QU		
1992 DEC	1QU	1QU		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	PHENOLICS)	DET'N LIMIT =	0.2	GUIDELINE = N/A
1991 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 APR	.600 <T	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	1.200	.800 <T	.800 <T	.800 <T	.800 <T	.800 <T	.800 <T
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	.400 <T	.400 <T	.400 <T	.400 <T	.400 <T	.400 <T	.400 <T
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	.400 <T	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		
ANTHRACENE (NG/L)		DET'N LIMIT = 1.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		
FLUORANTHENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = 42000 (D4)	
7 SAMPLES	BDL	BDL		
PYRENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		
BENZO(A)ANTHRACENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		
CHRYSENE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		
DIMETH. BENZ(A)ANTHR (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = N/A	
4 SAMPLES	BDL	BDL		
BENZO(E) PYRENE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		
BENZO(B) FLUORANTHENE (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		
PERYLENE (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		
BENZO(K) FLUORANTHENE (NG/L)		DET'N LIMIT = 1.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		
BENZO(A) PYRENE (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = 10 (A1)	
7 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
POLYAROMATIC HYDROCARBONS				
BENZO(G,H,I) PERYLEN (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A
7 SAMPLES	BDL	BDL		
DIBENZO(A,H) ANTHRAC (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A
7 SAMPLES	BDL	BDL		
INDENO(1,2,3-C,D) PY (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A
7 SAMPLES	BDL	BDL		
BENZO(B) CHRYSENE (NG/L)		DET'N LIMIT = 2.0		GUIDELINE = N/A
7 SAMPLES	BDL	BDL		
CORONENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A
7 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
SPECIFIC PESTICIDES				
TOXAPHENE (NG/L)		DET'N LIMIT = 500.0	GUIDELINE = 5000 (A1)	
3 SAMPLES	BDL	BDL		
2,4,5-T (NG/L)				
2 SAMPLES	BDL	DET'N LIMIT = 50.0	GUIDELINE = 280000 (A1)	
2,4-D (NG/L)				
2 SAMPLES	BDL	DET'N LIMIT = 100.0	GUIDELINE = 100000 (A1)	
2,4-DB (NG/L)				
2 SAMPLES	BDL	DET'N LIMIT = 200.0	GUIDELINE = N/A	
2,4-D PROPIONIC ACID (NG/L)				
2 SAMPLES	BDL	DET'N LIMIT = 100.0	GUIDELINE = N/A	
DICAMBA (NG/L)				
2 SAMPLES	BDL	DET'N LIMIT = 50.0	GUIDELINE = 120000 (A1)	
2,4,5-TP (SILVEX) (NG/L)				
2 SAMPLES	BDL	DET'N LIMIT = 20.00	GUIDELINE = 10000 (A1)	
CARBOFURAN (NG/L)				
1 SAMPLES	IRE	DET'N LIMIT = 2000.0	GUIDELINE = 90000 (A1)	
CHLORPROPHAM (CIPC) (NG/L)				
1 SAMPLES	IRE	DET'N LIMIT = 2000.0	GUIDELINE = 350000 (G)	
DIALATE (NG/L)				
1 SAMPLES	IRE	DET'N LIMIT = 2000.0	GUIDELINE = N/A	
EPTAM (NG/L)				
1 SAMPLES	IRE	DET'N LIMIT = 2000.0	GUIDELINE = N/A	
IPC (NG/L)				
1 SAMPLES	IRE	DET'N LIMIT = 2000.0	GUIDELINE = N/A	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
SPECIFIC PESTICIDES				
PROFOXUR (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = 140000 (D3)	
1 SAMPLES	IRE	BDL		
CARBARYL (NG/L)		DET'N LIMIT = 200.0	GUIDELINE = 90000 (A1)	
1 SAMPLES	IRE	BDL		
BUTYLATE (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = 245000 (D3)	
1 SAMPLES	IRE	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
VOLATILES				
BENZENE (UG/L)	BOL	DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)	
30 SAMPLES	BOL	BOL		
TOLUENE (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 24 (A3)	
1991 FEB	BOL	BOL		
1991 APR	BOL	.950		
1991 JUN	BOL	.050 <T		
1991 AUG	BOL	BOL		
1991 OCT	BOL	.050 <T		
1991 NOV	BOL	.050 <T		
1992 MAR	BOL	.050 <T		
1992 JUN	BOL	BOL		
1992 SEP	.050 <T	.100 <T		
1992 DEC	BOL	.150 <T		
ETHYLBENZENE (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 2.4 (A3)	
1991 FEB	.050 <T	BOL		
1991 APR	BOL	.200 <T		
1991 JUN	BOL	.050 <T		
1991 AUG	.050 <T	.050 <T		
1991 OCT	BOL	.100 <T		
1991 NOV	BOL	.050 <T		
1992 MAR	BOL	.050 <T		
1992 JUN	.100 <T	.050 <T		
1992 SEP	.200 <T	.100 <T		
1992 DEC	BOL	.050 <T		
P-XYLENE (UG/L)				
		DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)	
30 SAMPLES	BOL	BOL		
M-XYLENE (UG/L)				
		DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)	
1991 FEB	BOL	BOL		
1991 APR	BOL	.600 <T		
1991 JUN	BOL	.100 <T		
1991 AUG	BOL	BOL		
1991 OCT	BOL	BOL		
1991 NOV	BOL	BOL		
1992 MAR	BOL	.200 <T		
1992 JUN	BOL	BOL		
1992 SEP	.900 <T	BOL		
1992 DEC	BOL	BOL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
VOLATILES				
O-XYLENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 300 (A3*)	
1991 FEB	BDL	BDL		
1991 APR	BDL	.350 <T		
1991 JUN	BDL	BDL		
1991 AUG	BDL	BDL		
1991 OCT	BDL	BDL		
1991 NOV	BDL	BDL		
1992 MAR	BDL	.100 <T		
1992 JUN	BDL	BDL		
1992 SEP	.050 <T	BDL		
1992 DEC	BDL	BDL		
STYRENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 100 (D1)	
1991 FEB	.050 <T	BDL		
1991 APR	BDL	BDL		
1991 JUN	BDL	.050 <T		
1991 AUG	.100 <T	BDL		
1991 OCT	BDL	BDL		
1991 NOV	.100 <T	BDL		
1992 MAR	BDL	.100 <T		
1992 JUN	.150 <T	BDL		
1992 SEP	.100 <T	BDL		
1992 DEC	BDL	.100 <T		
1,1-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 7 (D1)	
30 SAMPLES	BDL	BDL		
METHYLENE CHLORIDE (UG/L)		DET'N LIMIT = 0.50	GUIDELINE = 50 (A1)	
30 SAMPLES	BDL	BDL		
1,1,2-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 70 (D1)	
30 SAMPLES	BDL	BDL		
1,1-DICHLOROETHANE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = N/A	
30 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
VOLATILES				
CHLOROFORM (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)	
1991 FEB	BDL	17,000	13,600	
1991 APR	BDL	25,200	19,100	
1991 JUN	BDL	22,300	14,900	
1991 AUG	BDL	32,500	42,600	
1991 OCT	BDL	18,800	20,700	
1991 NOV	BDL	17,500	12,900	
1992 MAR	BDL	19,800	12,200	
1992 JUN	BDL	19,400	17,800	
1992 SEP	BDL	24,300	20,500	
1992 DEC	BDL	19,700	9,700	
1,1,1-TRICHLOROETHANE (UG/L)				
		DET'N LIMIT = 0.02	GUIDELINE = 200 (D1)	
1991 FEB	BDL	.040 <T		
1991 APR	BDL	BDL		
1991 JUN	BDL	BDL		
1991 AUG	BDL	BDL		
1991 OCT	BDL	BDL		
1991 NOV	BDL	BDL		
1992 MAR	BDL	BDL		
1992 JUN	BDL	BDL		
1992 SEP	BDL	BDL		
1992 DEC	BDL	BDL		
1,2-DICHLOROETHANE (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)	
30 SAMPLES	BDL	BDL		
CARBON TETRACHLORIDE (UG/L)				
		DET'N LIMIT = 0.20	GUIDELINE = 5 (A1)	
30 SAMPLES	BDL	BDL		
1,2-DICHLOROPROPANE (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 5 (D1)	
30 SAMPLES	BDL	BDL		
TRICHLOROETHYLENE (UG/L)				
		DET'N LIMIT = 0.10	GUIDELINE = 50 (A1)	
30 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
VOLATILES				
DICHLOROBROMOMETHANE (UG/L)				DET'N LIMIT = 0.05 GUIDELINE = 350 (A1+)
1991 FEB	BOL	9.800	7.450	
1991 APR	BOL	13.150	10.850	
1991 JUN	BOL	13.000	10.150	
1991 AUG	BOL	13.150	15.600	
1991 OCT	BOL	12.000	12.850	
1991 NOV	BOL	10.000	7.950	
1992 MAR	BOL	12.800	8.500	
1992 JUN	BOL	12.950	11.000	
1992 SEP	BOL	14.200	14.350	
1992 DEC	BOL	14.700	8.150	
112-TRICHLOROETHANE (UG/L)				DET'N LIMIT = 0.05 GUIDELINE = 0.6 (D4)
30 SAMPLES	BOL	BOL	BOL	
CHLORODIBROMOMETHANE (UG/L)				DET'N LIMIT = 0.10 GUIDELINE = 350 (A1+)
1991 FEB	BOL	3.200	2.500	
1991 APR	BOL	6.400	4.200	
1991 JUN	BOL	6.000	5.000	
1991 AUG	BOL	4.400	4.400	
1991 OCT	BOL	4.800	5.100	
1991 NOV	BOL	3.400	3.100	
1992 MAR	BOL	5.100	3.800	
1992 JUN	BOL	6.100	5.200	
1992 SEP	BOL	6.200	7.100	
1992 DEC	BOL	6.700	4.500	
TETRACHLOROETHYLENE (UG/L)				DET'N LIMIT = 0.05 GUIDELINE = 65 (A5)
30 SAMPLES	BOL	BOL	BOL	
BROMOFORM (UG/L)				DET'N LIMIT = 0.20 GUIDELINE = 350 (A1+)
1991 FEB	BOL	BOL	BOL	
1991 APR	BOL	.400 <T	.600 <T	
1991 JUN	BOL	.600 <T	.600 <T	
1991 AUG	BOL	BOL	BOL	
1991 OCT	BOL	BOL	BOL	
1991 NOV	BOL	BOL	BOL	
1992 MAR	BOL	BOL	BOL	
1992 JUN	BOL	BOL	BOL	
1992 SEP	BOL	BOL	1.000 <T	
1992 DEC	BOL	.800 <T	.600 <T	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST FREE FLOW	DIST. SYSTEM LOIS ST STANDING
VOLATILES			
1,1,2,2-TETRACHLOROETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 0.17 (D4)
30 SAMPLES	BOL	BOL	
VINYL CHLORIDE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 2 (D1)
12 SAMPLES	BOL	BOL	
1,2-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 70 (D1)
12 SAMPLES	BOL	BOL	
CHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 1510 (D3)
30 SAMPLES	BOL	BOL	
1,4-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 5 (A1)
30 SAMPLES	BOL	BOL	
1,3-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 3750 (D3)
30 SAMPLES	BOL	BOL	
1,2-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 200 (A1)
30 SAMPLES	BOL	BOL	
ETHYLENE DIBROMIDE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 50 (D1)
30 SAMPLES	BOL	BOL	
TOTAL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)
1991 FEB	BOL	29,950	23,550
1991 APR	BOL	45,150	34,700
1991 JUN	BOL	41,900	30,650
1991 AUG	BOL	50,050	62,600
1991 OCT	BOL	35,600	38,650
1991 NOV	BOL	30,900	24,000
1991 DEC	BOL	37,700	24,500
1992 JAN	BOL	38,450	34,000
1992 FEB	BOL	44,700	42,950
1992 MAR	BOL	41,900	22,950

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 PORT STANLEY WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LOIS ST %FREE FLOW	DIST. SYSTEM LOIS ST STANDING	
RADIONUCLIDES				
COBALT 60 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = N/A	
4 SAMPLES	BDL			
CESIUM 134 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = N/A	
4 SAMPLES	BDL			
CESIUM 137 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = 50 (A1)	
4 SAMPLES	BDL			
GROSS ALPHA COUNT (BQ/L)		DET'N LIMIT = 0.04	GUIDELINE = 0.55 (D1)	
1991 JUN	BDL			
1992 MAR	BDL			
GROSS BETA COUNT (BQ/L)		DET'N LIMIT = 0.04	GUIDELINE = N/A	
1991 JUN	.110			
1992 MAR	.080			
TRITIUM (BQ/L)		DET'N LIMIT = 7.00	GUIDELINE = 40000 (A1)	
4 SAMPLES	BDL			
IODINE 131 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = 10 (A1)	
4 SAMPLES	BDL			

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.20	30-500 (A4)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.20	100.0 (F2)
CHLORIDE	MG/L	0.20	250.0 (A3)
COLOUR	TCU	0.50	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0 (A3)
FLUORIDE	MG/L	0.01	1.5* (A1)
HARDNESS	MG/L	0.50	80-100 (A4)
IONCAL	DMNSLESS	N/A	N/A
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.10	30.0 (F2)
NITRATES (TOTAL)	MG/L	0.005	10.0 (A1)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
POTASSIUM	MG/L	0.010	10.0 (F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0 (A3)
SODIUM	MG/L	0.20	200.0 (A4)
SULPHATE	MG/L	0.20	500.0 (A4)
TURBIDITY	FTU	0.05	1.0 (A1)
* The Maximum Acceptable Concentration (MAC) for <u>naturally occurring fluoride</u> in drinking water is 2.4 mg/L.			
CHLOROAROMATICS			
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	N/A
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
POLYNUCLEAR AROMATIC HYDROCARBONS			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DESETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADIX)	NG/L	100.0	10000 (A2)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	30000 (A1)
O,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDE	NG/L	1.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
DESETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.0	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.0	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000 (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A
2,4,5-TP (SILVEX)	NG/L	20.0	10000 (A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.0	90000 (A1)
CARBOFURAN	NG/L	2000.0	90000 (A1)
CHLORPROPHAM (CIPC)	NG/L	2000.0	350000 (G)
CHLORPYRIFOS (DURSABAN)	NG/L	20.0	N/A
DIALLATE	NG/L	2000.0	N/A
DIAZINON	NG/L	20.0	20000 (A1)
DICAMBA	NG/L	50.0	120000 (A1)
DICHLOROVOS	NG/L	20.0	N/A
EPTAM	NG/L	2000.0	N/A
ETHION	NG/L	20.0	35000 (G)
IPC	NG/L	2000.0	N/A
MALATHION	NG/L	20.0	190000 (A1)
METHYL PARATHION	NG/L	50.0	9000 (D3)
METHYLTRITHION	NG/L	20.0	N/A
MEVINPHOS	NG/L	20.0	N/A
PARATHION	NG/L	20.0	50000 (A1)
PHORATE (THIMET)	NG/L	20.0	2000 (A2)
PICHLORAM	NG/L	100.0	190000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000 (D3)
RELDAN	NG/L	20.0	N/A
RONNEL	NG/L	20.0	N/A
VOLATILES			
1,1-DICHLOROETHANE	UG/L	0.10	N/A
1,1-DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2-DICHLOROETHANE	UG/L	0.05	5 (A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5 (A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200 (D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17 (D4)

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	65 (A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)
VINYL CHLORIDE	UG/L	0.10	2 (D1)
RADIONUCLIDES			
TRITIUM	BQ/L	7.0	40000 (A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55# (D1)
GROSS BETA COUNT	BQ/L	0.04	N/A
COBALT 60	BQ/L	0.70	N/A
CESIUM 134	BQ/L	0.70	N/A
CESIUM 137	BQ/L	0.70	50 (A1)
IODINE 131	BQ/L	0.70	10 (A1)

Equal to 15.0 Picocuries/litre

DRINKING WATER SURVEILLANCE PROGRAM
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored.

The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

PARAMETER REFERENCE INFORMATION

NAME: BENZENE

CAS#: 71-43-2

MOLECULAR FORMULAE: C_6H_6

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 $\mu g/L$

SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27)
CYCLOHEXATRIENE (41)

CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF
HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN
WITH SMOKING FLAME (30)

PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41)
THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER
THRESHOLD TASTE: 0.5 mg/L IN WATER (39)
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS
AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT
A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES,
SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM
SOILS OR ARE DEGRADED RATHER QUICKLY (80)

SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR
DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES;
COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER
COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND
RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING
AGENT; GASOLINE.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING
BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION
WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION,
COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION,
OXIDATION

ADDITIONAL PROPERTIES: MOLECULAR WEIGHT: 78.12
MELTING POINT: 5.5°C (27)
BOILING POINT: 80.1°C (27)
SPECIFIC GRAVITY: 0.8790 AT 20°C (27)
VAPOUR PRESSURE: 100 MM AT 26.1°C (27)
HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41)
LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39)
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)
SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Specific Pesticides (OWCP), (PEOP), (PECAR)	-as per Organics -three extra bottles must be filled
Polyaromatic hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate
Cyanide (Treated only)	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide (NaOH) (Caution: NaOH is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid (HNO_3) - and potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) (Caution: HNO_3 & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)

Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year) (PBVOL), (PBEXT)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)-

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid HNO_3 (Caution: HNO_3 is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Polyaromatic Hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

